EXHIBIT A165

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Sealed Cache of Moon Rocks to Be Opened by NASA

A half-century ago, three containers of lunar samples were set aside, to await study by more advanced technology. Their time has come.

By Shannon Hall

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Later this year, NASA will reveal never-before-seen morsels of the moon, the agency announced on Monday.

The astronauts of the Apollo missions that landed on the moon from 1969 to 1972 collected 842 pounds worth of lunar rocks, core samples, pebbles, sand and dust. Many of those samples were later opened on the ground. But three have remained sealed — their contents stashed away for nearly 50 years.

They were intentionally saved for a time when more advanced technology would allow planetary scientists on Earth to delve deeper into the moon's mysteries.

"The technology available in the '60s and '70s wasn't able to do what we can do now," said Jessica Barnes, an astronomer soon to join the University of Arizona's Lunar and Planetary Laboratory. "Now we can go to a mineral and we can look at the very fine details, down to almost the width of a human hair."

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In a year marking the 50th anniversary of the Apollo 11 landing, and with American space priorities shifting toward a return to the moon, NASA has at last decided that it's time to open the long-locked samples. The agency selected nine teams to study the moon rocks in detail.

For the past decade, Charles Shearer, a scientist at the University of New Mexico, has pressed NASA to unseal the rocks. He was thrilled by the news: "We are completing the Apollo mission adventure after 50 years, using new types of measurements and new views of our moon."

Darby Dyar, a scientist at Mount Holyoke College, agreed. She first studied lunar samples in 1979, as an undergraduate, and has come full circle as a leader of one of the selected teams.

Dr. Dyar and her colleagues will scour materials from Apollo 15, 16, and 17, searching for yellow, orange and green glass beads roughly the size of a grain of salt. Those beads formed when the droplets within fire fountains — picture an Old Faithful of lava — hit the lunar atmosphere and

cooled.

“Imagine spraying a squirt gun of hot lava,” Dr. Dyar said. “Because the droplets are so tiny, they cool immediately.”

And those cooled droplets, or glass beads, are a treasure trove for scientists. They provide a window into the interior of the moon, and could answer fundamental questions about how our nearest neighbor evolved.

The moon’s history is a common theme in many of the selected projects. Kees Welten, a scientist at the University of California, Berkeley, and his team will study a core collected by Harrison Schmitt and Gene Cernan, the Apollo 17 astronauts, in order to better gauge the impact history of the moon. That can be used as a proxy for other planets in the solar system (including Earth) whose craters long-ago disappeared.

Other teams are looking toward the future.

Dr. Barnes and her colleagues will analyze four rocks collected from the same site where Apollo 17 landed. Chemically, the samples are very similar to one another — except one was chilled to -20 degrees Celsius within a month of return. It has remained in cold storage ever since.

Scientists will be scouring the rocks in search of yellow, orange and green glass beads the size of a grain of salt. Project Apollo Archive/NASA

But scientists are unsure whether freezing the samples is a better storage method than keeping samples at ambient laboratory temperatures. By comparing the chilled sample with the room-temperature samples, the team will be able to assess the frozen curation technique for the first time.

“We’ve never had the opportunity to do this kind of study,” Dr. Barnes said. “It’s a unique chance to get at a currently unanswered question that’s really important for future sample return missions.”

Those missions include a Japanese spacecraft, Hayabusa2, which currently is collecting samples from the Ryugu asteroid; an American spacecraft, Osiris-Rex, which will collect samples from the Bennu asteroid; and future missions to the moon and Mars.

Clive Neal, a scientist at the University of Notre Dame who will work with Dr. Shearer on another team, said that preparing for future missions to the moon makes it important to open the lunar samples now.

“We did have the technology 10 years ago, but we didn’t have the drive,” Dr. Neal said. “Now, we’re going back to the moon and we need to use lunar resources in order to do it sustainably.”

That was made possible in 2008, when scientists discovered that the moon was not bone dry, but contained water. With water, future astronauts might be able to quench their thirst, and they also will be able to split its molecules into oxygen, to breathe, and liquid hydrogen, to refill their fuel tanks — thus helping sustain a lunar outpost.

But scientists can’t yet pinpoint how much water is on the moon, Dr. Neal said:

“That starts with this particular project of these unopened Apollo samples.”

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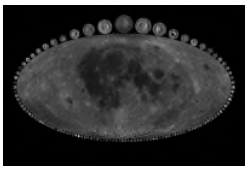

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